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⑤④ **DISPOSABLE IMPREGNATED WIPE FOR CLEANING OR MAINTAINING HARD SURFACES.**

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**US-A- 4 338 366**

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## Description

The present invention relates to a disposable impregnated wipe for cleaning or upkeep of surfaces, such as glass, mirrors, tiles or other household surfaces.

A number of wipes impregnated or coated with products for cleaning or maintaining various household surfaces are already known. In general such wipes have as object to eliminate soil and/or to deposit a layer of products for protecting or improving the state of the surface. In the majority of cases they exist in the moist state in the form of absorbent substrates impregnated with liquid compositions. Thus, British Patent Specification No 1,461,730 (Johnson) discloses a disposable wipe having a liquids absorbance capacity of at least 200 % by weight, impregnated to at most 50 % of the said absorption capacity, with a composition in the form of an oil-in-water emulsion. This disposable impregnated wipe is used for applying a protective polysiloxane and mineral oil based film to the surface to be treated.

Similarly, the specification to EP-A-0,211,773 (Kimberly-Clark) relates to a disposable wipe impregnated with a composition comprising a wax, a silicone oil and a detergent or soap. When this wipe is partially impregnated with this composition, it can absorb water in amount comprising between 200 % and 800 % of its weight. This wipe is used for applying a protective film based on wax and silicone oil on a car still wet after washing it.

United States Patent No 4,666,621 (Clark et al) relates to a wipe impregnated with a liquid composition for cleaning hard surfaces without leaving trails or fluff, comprising a non-woven material containing wood pulp and synthetic fibres, the liquid composition including about 0.001 to about 1 per cent by weight of a surfactant, about 1 to about 40 per cent by weight of an aliphatic mono-alcohol having 1 to 6 carbon atoms and about 60 to about 99 per cent by weight of demineralized water, the non-woven material containing in addition about 0.225 to about 2.25 per cent by weight with respect to the weight of a non-woven material of an acrylic polymer. This wipe, however, leaves slight trails on the clean glass surface, when it is used in a single horizontal pass.

The Applicant has established as objective to obtain a single use disposable wipe impregnated with a liquid composition in conditions such that in use, it leads in part to the total elimination of soil and in part to the appearance of the surface free from trails or films resulting from deposition of any cleaning product with which it is impregnated or of the substrate itself.

These conditions are connected with the nature of the substrate itself which must meet the following criteria :

- resistance to tearing in the moist state,
- ability to absorb water to at least 200 % of its dry weight,
- insolubility in anyone of the constituents of the liquid composition or their mixtures,
- absence of the ability to liberate or to salt out insoluble solid materials.

Materials meeting these conditions are preferably chosen from amongst hydrophilic woven materials which do not produce fluff, such as cotton fabrics and other cellulosic fabrics, non-woven materials obtained by wet or dry methods.

Preferably, for use in the invention the materials have a superficial density or grammage of at least 20 g/m<sup>2</sup>.

These conditions are equally connected with the nature of the impregnation composition and the quantity of the latter retained by the substrate, the quantity being expressed as a percentage of the maximum water absorption of the dry substrate.

The objective that the Applicant has fixed on is achieved by the object of the present invention which consists in disposable, imprgnated wipe for cleaning and maintaining surfaces, including a hydrophilic woven or non-woven material obtained by wet or dry methods, having a maximum water absorption capacity of at least 200 % by weight, impregnated with an aqueous composition to a level of impregnation not exceeding 50 % of this maximum absorption capacity, which is characterized in that the aqueous composition is in the form of an aqueous solution containing :

at least one water-miscible solvent at a rate of at least 4 % by weight of the total weight of the aqueous composition, and

at least one mineral or organic acid in sufficient quantity to confer an acid pH on the said solution.

Advantageously, this pH is between 2 and 5 and optimally lies between 3.5 and 3.8.

Preferably, the mineral or organic acid is selected from acids having no physico-chemical action on the hydrophilic material, notably acetic, citric, maleic, phosphoric and alkylsulfonic acids.

Preferably each water-miscible solvent is selected from those volatile solvents with a vapour pressure at 20°C above 13 Pa, notably alcohols containing 1 to 4 carbon atoms, such as methanol, ethanol, isopropanol, butanol, glycols and glycol ethers containing 2 to 8 carbon atoms, notably monoethylene glycol butyl ether, and volatile silicones, notably DC 344 (marketed by Dow Corning).

In accordance with one preferred characteristic, the level of impregnation lies between 5 and 35 % of the

maximum absorption capacity of the material in its dry state in strict dependence on the nature of the said material.

In accordance with another preferred characteristic the water-miscible solvent(s) are present at a level of 5 to 40 % by weight in relation to the total weight of the said aqueous solution.

In accordance with other characteristics, the aqueous solution can contain inter alia a small amount of an ionic, nonionic or amphoteric surfactant and small amounts of at least one product selected from disinfectants, perfumes, colorants and preservatives.

The following examples, given by way of illustration and non-limitatively, are wipes in accordance with the invention :

#### Example 1

A non-woven material (referred to hereafter by a letter A) supplied by Société Française des Non Tissés under reference 2406 of grammage 35 g/m<sup>2</sup> was used.

It is a mixture of cellulose, cotton and polyester with an acrylic-vinyl binder in the ratio 75 % fibres per 25 % binder (wet method processed). This material has the ability to absorb water at 125 g/m<sup>2</sup>.

A square (30 X 30 cm) of this material is impregnated at 35 g/m<sup>2</sup> (approximately 25 % of the maximum absorption quantity) with an aqueous composition of the following formula :

Monoethyleneglycol butyl ether	8 % by weight
Ethanol (95 %)	10 %
Formaldehyde (30 %)	0.1 %
Acetic acid (100 %)	0.1 %
Water	81.8 %
pH = 3,7	

The impregnation was effected by putting the material into contact with the quantity of composition corresponding to the above level of impregnation (25 % by weight).

The cleaning efficacy of the material was tested in the following manner :

A fatty, soiling composition was prepared from lard, margarine, carbon black and ferrous and ferric oxides, 0.04 g of this composition was spread over a black pane of glass (30 X 40 cm).

The thus soiled glass was wiped off with regular to and for movements applied from top to bottom and then from left to right alternatively for 1 minute. The result was visually assessed by a group of fifteen people trained in this sort of assessment and scored on a scale 0 to 5 :

- 0 = very bad, many trails,
- 1 = bad,
- 2 = insufficient,
- 3 = acceptable,
- 4 = good,
- 5 = excellent no trails.

Table 1 hereafter gives the averages of the results obtained for comparison with different levels of impregnation on the same non-woven material.

This table shows that for an impregnation level of 25 % the score is 5, signifying excellent results with no trails on the black glass.

#### Example 2

Example 1 was followed except that different materials were used :

A non-woven (referred to hereafter as B) commercially referred to as PPV 3000 by Société Nordlys, of grammage 30 g/m<sup>2</sup> and maximum water absorption of 182 g/m<sup>2</sup> made from 100 % mixture of polypropylene/viscose, without a binder, obtained by a dry method was used.

A non-woven (referred to hereafter as C) commercially referred to as HOMECEL 90 by Société Kayserberg, of grammage 90 g/m<sup>2</sup> and maximum water absorption capacity of 880 g/m<sup>2</sup> made from 80 % cellulose fibres and 20 % acrylic binder, thermobonded and obtained by dry method was used.

Table II hereafter shows the results obtained for comparison with the results of Example 1.

This table shows that for non-woven B, a level of impregnation of 10 % gives results between good and excellent although for non-woven C, a level of impregnation of 35 % gives excellent results.

#### Example 2 bis

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Examples 1 and 2 were followed except that different materials were used :

A non-woven (referred to hereafter as D) commercially referred to as 4175 by Société Nordlys, of grammage 50 g/m<sup>2</sup> and maximum water absorption capacity 465 g/m<sup>2</sup> made from 70 % cotton/viscose fibres and 30 % acrylic binder and obtained by dry method was used.

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A non-woven (referred to hereafter as E) commercially referred to as 2426 by Société Française des Non Tissés, of grammage 55 g/m<sup>2</sup> and maximum water absorption capacity 179 g/m<sup>2</sup> made from 75 % cellulose/polyester fibres, and 25 % acrylic/vinyl binder and obtained by wet method was used.

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A non-woven (referred to hereafter as F) commercially referred to as 1140 by Société Française des Non Tissés, of grammage 45 g/m<sup>2</sup> and maximum water absorption 160 g/m<sup>2</sup> made from 50 % cotton fibres, 30 % viscose fibres, 20 % acrylic binder and obtained by wet method.

Table II bis hereafter shows the results obtained for comparison with the results of Example 1. This table shows that for the non-woven D, a level of impregnation of 10 % gives almost excellent (assessed 4.8) results, although with the non-wovens E and F a result assessed excellent is obtained for a level of impregnation of 25 %.

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#### Exemple 3

The same non-woven material referred to as A in Example 1 was used.  
Impregnation was done by means of the following composition :

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25	Monoethylene glycol butyl ether	8 % by weight .
	Ethanol (95 %)	10 %
	Formaldehyde (30 %)	0.1 %
30	Sodium lauryl ether sulphate	0.2 %
	Sodium alkylsulphate	0.4 %
	Water	81.3 %

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The pH is 5 due to the technical grade of the surfactants used and which contain some acid.

The results obtained figure in table III below. A level of impregnation of 25 % produces results lying between good and excellent, slightly below the excellent result of Example 1.

#### Example 4

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Various formulations of aqueous solution for impregnation were prepared and are combined in table IV.

Formulae 1 to 8 were prepared with an acid pH in accordance with the invention.

Formulae 9 to 11 were prepared with a non-acid pH, and by virtue of that fact are not part of the invention.

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The non-woven A of Example 1 was impregnated to different levels using, each time, one of the formulae 1 to 11 and testing of efficacy was done as in Example 1.

Table V shows the results obtained.

It can be seen surprisingly that an acid pH for wipes impregnated with formulae 1 to 8 produces results assessed between acceptable and excellent, whereas formulae 9 to 11 where there has been no acid added and the pH lies between 7.1 and 7.3 gave results assessed insufficient.

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Table IV and V show still more surprisingly that those formulae that have pH between 3.5 and 3.8 lead to good or excellent results.

The test of Example 1 allows the determination of the conditions of maximum efficacy of an impregnated wipe in accordance with the present invention which have not been described in the preceding Examples.

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It will be understood that in their commercial form, these wipes will be packaged in hermetically sealed containers to avoid undesirable evaporation of solvent.

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TABLE I

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Level of Impregnation(%)	0	5	15	20	25	30	35	50
Efficacy (Scale 0 to 5) Non-woven A	0.5	1.5	4.0	4.8	5.0	4.0	2.0	0.5

TABLE II

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Level of Impregnation(%)	0	5	10	15	20	25	30	35	50
Efficacy of: Non-woven A	0.5	1.5	-	4.0	4.8	5.0	4.0	2.0	0.5
Non-woven B	-	3.0	4.5	4.0	-	1.5	-	0.5	-
Non-woven C	-	-	1.5	2.5	-	4.4	-	5.0	2.0

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TABLE II bis

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Level of Impregnation(%)	0	5	10	15	20	25	30	35	40	45	50
Efficacy of: Non-woven A	0.5	1.5	-	4.0	4.8	5.0	4.0	2.0	-	-	0.5
Non-woven D	0.5	3.5	4.8	4.4	2.7	1.7	1.0	-	-	-	-
Non-woven E	0.5	1.5	-	4.0	4.8	5.0	4.2	2.5	1.6	-	0.6
Non-woven F	-	-	3.0	4.4	4.9	5.0	4.5	2.9	1.7	-	-

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TABLE III

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Level of Impregnation(%)	0	5	10	15	20	25	30	35	40	50
Efficacy of: Non-woven A	0.5	-	1.7	-	4.2	4.5	3.4	1.7	-	-

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Table IV

No of Formulas Components Age by weight	1	2	3	4	5	6	7	8	9	10	11
Monoethylene glycol butyl ether	8		10	10		8	8	8	8	8	8
Ethanol (95%)	10	10			10	10	10	10	10	10	10
Sodium lauryl- ether sulphate						0.2				0.2	0.2
Sodium alkyl- sulphonate						0.4				0.4	0.4
Fluorinated surfactant (FURDAPAC 1033 of Atochem)							0.1				0.1
Acetic acid (pure)	0.1		0.1		0.1	0.1	0.1	0.1			
Hydrochloric acid (expressed pure)		0.1		0.1							
Volatile silicone (DC304 of Dow Corning)								0.6			
Formaldehyde (30%)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Water	81.8	89.8	89.8	89.8	89.8	81.2	81.7	81.2	81.9	81.3	81.2
pH of composition	3.7	2.1	3.6	2.1	3.8	3.5	3.7	3.7	7.3	7.1	7.1

Table V

Level of improvement & efficacy of formulae No	0	5	10	15	20	25	30	35	40	45	50
1	0,5	1,5	-	4,0	4,8	5,0	4,0	2,0	-	-	0,5
2	0,5	1,3	1,8	2,7	3,5	3,7	3,2	2,0	1,3	1,0	0,7
3	-	1,5	-	3,2	3,8	4,0	3,5	2,3	-	1,2	-
4	-	1,3	-	2,5	3,3	3,5	3,0	2,2	-	1,0	-
5	0,5	1,5	2,5	3,3	4,3	4,5	3,7	2,3	1,7	1,2	0,7
6	0,5	-	2,5	3,7	4,5	4,8	3,8	2,1	-	0,9	-
7	-	-	3,0	4,3	5,0	5,0	4,5	3,0	-	-	-
8	-	-	2,5	3,7	4,5	4,7	3,8	2,0	-	1,0	-
9	0,5	-	-	1,2	1,7	2,3	2,2	1,7	-	-	0,7
10	-	-	1,0	-	1,7	2,0	1,7	1,3	-	-	-
11	-	-	0,8	-	1,2	1,2	1,2	-	0,8	-	0,5



## Claims

- 5 1. A disposable impregnated wipe for cleaning and maintaining surfaces, consisting of a woven or nonwoven hydrophilic material, obtained by wet or dry method and having a maximum absorption capacity for water of at least 200 % by weight in the dry state, impregnated with an aqueous composition to a level not exceeding 50 % of the maximum absorption capacity, characterized in that the aqueous composition occurs in the form of an aqueous solution containing at least 4 % by weight based on the total weight of the aqueous composition
- 10 of at least one water-miscible solvent and at least one mineral or organic acid in amount sufficient to produce an acid pH in the said solution.
  2. A wipe as claimed in claim 1, characterized in that the pH is between 2 and 5.
  3. A wipe as claimed in claim 2, characterized in that the pH is between 3.5 and 3.8.
  4. A wipe as claimed in anyone of claims 1 to 3, characterized in that the solution further contains a small
  - 15 amount of a surfactant.
  5. A wipe as claimed in anyone of claims 1 to 4, characterized in that the total water-miscible solvent content is 5 to 40 % by weight of the total weight of the aqueous solution.
  6. A wipe as claimed in claim 5, characterized in that the solvent(s) is selected from alcohols containing 1 to 4 carbon atoms, glycols and glycol ethers containing 2 to 8 carbon atoms, and volatile silicones.
  - 20 7. A wipe as claimed in anyone of claims 1 to 6, characterized in that the acid is at least one of acetic, citric, maleic, phosphoric or alkylsulphonic acid.
  8. A wipe as claimed in anyone of claims 1 to 7, characterized in that the said solution contains small amounts of at least one disinfectant, perfume, colorant or preservative substance.
  9. A wipe as claimed in anyone of claims 1 to 8, characterized in that the said material has grammage of
  - 25 at least 20 g/m<sup>2</sup>.
  10. A wipe as claimed in anyone of claims 1 to 9, characterized in that the said level of impregnation lies in the range 5 to 35 % of the maximum absorption capacity of the said material in the dry state.

## 30 Revendications

1. Eponge imprégnée jetable pour le nettoyage et l'entretien de surfaces, constituée d'une matière hydrophile tissée ou non tissée, obtenue par un procédé par voie humide ou par voie sèche et ayant une capacité maximale d'absorption de l'eau d'au moins 200% en poids à l'état sec, imprégnée d'une composition aqueuse
- 35 dans une proportion ne dépassant pas 50% de la capacité maximale d'absorption, caractérisée en ce que la composition aqueuse se présente sous la forme d'une solution aqueuse contenant au moins 4% en poids, sur la base du poids total de la composition aqueuse, d'au moins un solvant miscible à l'eau et au moins un acide minéral ou organique en quantité suffisante pour que la solution ait un pH acide.
2. Eponge suivant la revendication 1, caractérisée en ce que le pH est compris entre 2 et 5.
- 40 3. Eponge suivant la revendication 2, caractérisée en ce que le pH est compris entre 3.5 et 3.8.
4. Eponge suivant l'une quelconque des revendications 1 à 3, caractérisée en ce que la solution contient en outre une petite quantité d'un agent surfactif.
5. Eponge suivant l'une quelconque des revendications 1 à 4, caractérisée en ce que la teneur totale en solvant miscible à l'eau est de 5 à 40% en poids par rapport au poids total de la solution aqueuse.
- 45 6. Eponge suivant la revendication 5, caractérisée en ce que le ou les solvants sont choisis entre des alcools contenant 1 à 4 atomes de carbone, des glycols et des éthers de glycol contenant 2 à 8 atomes de carbone, et des silicones volatiles.
7. Eponge suivant l'une quelconque des revendications 1 à 6, caractérisée en ce que l'acide est au moins l'un des acides tels que l'acide acétique, l'acide citrique, l'acide maléique, l'acide phosphorique ou un acide
- 50 alkylsulfonique.
8. Eponge suivant l'une quelconque des revendications 1 à 7, caractérisée en ce que la solution contient de petites quantités d'au moins un désinfectant, un parfum, une matière colorante ou une substance de conservation.
9. Eponge suivant l'une quelconque des revendications 1 à 8, caractérisée en ce que ladite matière a un
- 55 grammage d'au moins 20 g/m<sup>2</sup>.
10. Eponge suivant l'une quelconque des revendications 1 à 9, caractérisée en ce que le degré d'imprégnation se situe dans la plage de 5 à 35% de la capacité maximale d'absorption de ladite matière à l'état sec.

## Patentansprüche

1. Imprägniertes Wegwerfwischtuch zum Reinigen und Pflegen von Oberflächen, bestehend aus einem hydrophilen Gewebe- oder Vliesmaterial, erhalten durch eine Naß- oder Trockenmethode und mit einer maximalen Absorptionsfähigkeit für Wasser von mindestens 200 Gew.% im trockenen Zustand, imprägniert mit einer wässrigen Zusammensetzung bis auf eine Konzentration, die 50 % der maximalen Absorptionsfähigkeit nicht übersteigt, dadurch gekennzeichnet, daß die wässrige Zusammensetzung in Form einer wässrigen Lösung vorliegt, die mindestens 4 Gew.%, bezogen auf das Gesamtgewicht der wässrigen Zusammensetzung, mindestens eines mit Wasser mischbaren Lösungsmittels und mindestens einer Mineralsäure oder organischen Säure in einer Menge, die ausreichend ist, in der Lösung einen sauren pH zu bewirken, enthält.
2. Wischtuch nach Anspruch 1, dadurch gekennzeichnet, daß der pH 2 bis 5 beträgt.
3. Wischtuch nach Anspruch 2, dadurch gekennzeichnet, daß der pH 3.5 bis 3.8 beträgt.
4. Wischtuch nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die Lösung auch eine kleine Menge eines Tensids enthält.
5. Wischtuch nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der Gesamtgehalt an mit Wasser mischbarem Lösungsmittel 5 bis 40 Gew.% des Gesamtgewichtes der wässrigen Lösung beträgt.
6. Wischtuch nach Anspruch 5, dadurch gekennzeichnet, daß das oder die Lösungsmittel ausgewählt sind aus Alkoholen mit 1 bis 4 Kohlenstoffatomen, Glykolen und Glykoläthern mit 2 bis 8 Kohlenstoffatomen und flüchtigen Silikonen.
7. Wischtuch nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß die Säure zumindest eine von Essig-, Citronen-, Malein-, Phosphor- oder Alkylsulfonsäure ist.
8. Wischtuch nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß die Lösung geringe Mengen zumindest eines Desinfektionsmittels, Parfüms, Farbstoffes oder Konservierungsmittels enthält.
9. Wischtuch nach einem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß das Material ein Flächen-  
gewicht von mindestens 20 g/m<sup>2</sup> aufweist.
10. Wischtuch nach einem der Ansprüche 1 bis 9, dadurch gekennzeichnet, daß die Imprägnierungskonzentration im Bereich von 5 bis 35 % der maximalen Absorptionsfähigkeit des Materials im trockenen Zustand liegt.